CONTRIBUTIONS FROM THE UNIVERSITY
OF MICHIGAN HERBARIUM, NO. 1

RUSTS FROM BRITISH HONDURAS

BY

EDWIN B. MAINS

NOTES ON AGARICS FROM BRITISH HONDURAS

BY

ALEXANDER H. SMITH

ANN ARBOR
UNIVERSITY OF MICHIGAN PRESS
MAY, 1939

Digitized

CONTRIBUTIONS FROM THE UNIVERSITY
OF MICHIGAN HERBARIUM, NO. 1

RUSTS FROM BRITISH HONDURAS

BY

EDWIN B. MAINS

NOTES ON AGARICS FROM BRITISH HONDURAS

BY

ALEXANDER H. SMITH

ANN ARBOR
UNIVERSITY OF MICHIGAN PRESS
MAY, 1939

CONTENTS

	PAGE
RUSTS FROM BRITISH HONDURAS. Edwin B. Mains	5
NOTES ON AGARICS FROM BRITISH HONDURAS. Alexander H. Smith	21

RUSTS FROM BRITISH HONDURAS

EDWIN B. MAINS

IN continuation of an investigation of the biology of the Maya area, a co-operative study of the University of Michigan and the Carnegie Institution of Washington, the writer and C. L. Lundell spent the summer of 1936 in an investigation of the flora of the El Cayo District of British Honduras.[1] The writer devoted his attention to the cryptogamic flora and specially to the Uredinales. There is very little information available concerning the rusts of British Honduras. In a previous publication (3) a few species, obtained by previous expeditions or from phanerogamic species, were reported. These have also been included in this account.

The first portion of the trip was spent south of the town of El Cayo, mostly at the mahogany camps of Valentin and Cohune Ridge. Short trips were also taken to Retiro and Chalillo Crossing. This region is covered with a luxuriant rain forest. Here a collector of rusts works under difficulties. Because of the luxuriant growth of the high rain forest only a small percentage of the vegetation can be closely inspected. As a result, most of the collections of rusts were obtained from the second growth which had sprung up around logging camps and along the roads.

The second portion of the trip was spent in the Mountain Pine Ridge, mostly at San Agustin and Vaquero. In this area pine and grasses predominate except along the streams and in islands of rain forest growing on the scattered limestone hills. Here grass rusts should have been abundant. Unfortunately the Indians burn the area each year, and collecting in this group was disappointing.

In this paper fifty-eight species in eleven genera are listed. Of these, ten species are described as new. Seven other species are known only from Central America or adjacent southern Mexico; nine only from Central and South America, and two only from Central America and the West Indies. It is interesting to note

[1] The expedition and the publication of this paper were made possible by grants from the Horace H. Rackham School of Graduate Studies.

that thirteen additional species have a distribution from the West Indies through Central America into South America with very little extension northward into Mexico. The remaining seventeen species have a general distribution in the tropical portions of the Americas. The tendency toward a distribution from the West Indies through Central America into tropical South America agrees with a similar tendency for a number of the phanerogamic species.

In the following list unless otherwise noted the collections were made by the author in the El Cayo District of British Honduras during the summer of 1936. Types and other specimens have been deposited in the Herbarium of the University of Michigan.

1. Alveolaria Cordiae Lagerh.—On *Cordia ferruginea*(Lam.) Roem. & Schult., Cohune Ridge, July 10 (3786); *Cordia* sp., Cohune Ridge, July 9 (3775). This is a very interesting rust. The teliospores form columns. They adhere more laterally than vertically, and the column breaks into circular plates. It has been reported from Jamaica, various parts of Central America, and northern South America.

2. Angiopsora pallescens (Arth.) Mains.—On *Tripsacum latifolium* Hitch., Vaquero, Aug. 10 (4104). This species has been known under the name *Puccinia pallescens* Arth. A similar rust on maize which has been included in the species has been recently recognized as a distinct species by the writer (4). *Angiopsora pallescens* has been reported from Mexico (state), Guatemala, Nicaragua, and Salvador.

3. Chaconia alutacea Juel.—On *Pithecolobium Recordii* (Britton & Rose) Standl., Sittee River, Sept. 4, 1930, W. A. Schipp (621A). This species has been known only from the type collected by C. A. M. Lindman, July 15, 1893, near Asunción, Gran Chaco, Paraguay. In a previous publication (3) it was suggested that the host was probably *Pithecolobium Peckii*. It is not that species but *P. Recordii*.

4. Cionothrix praelonga (Wint.) Arth.—On *Eupatorium* sp., Cohune Ridge, July 9 (3782), July 10 (3787); Chalillo

Crossing, July 16 (3861). Arthur considers this a short-cycled Cronartium in the Melampsoraceae. Dietel has placed it in the Pucciniaceae. It has been reported from Vera Cruz, Mexico, and from Central and South America.

5. Coleosporium Elephantopodis (Schw.) Thum.—On *Elephantopus mollis* H.B.K., San Agustin, Aug. 3 (4041); *Orthopappus angustifolius* (Swartz) Gleason, San Agustin, July 27 (3973); July 29 (3993, 4001), Aug. 7 (4091); *Pseudelephantopus* sp., San Agustin, July 26 (3926). A widespread rust in the warmer regions of the Americas.

6. Coleosporium Eupatorii Arth.—On *Eupatorium Oerstedianum* Benth., San Agustin, July 23 (3877), July 26 (3946, 3947). This species is widely distributed in the West Indies, Central America, and northern South America.

7. Coleosporium Ipomoeae (Schw.) Burrill.—On *Ipomoea* sp., Benque Viejo, June 17 (3527); San Agustin, July 26 (3948); *Jacquemontia azurea* (Desr.) Choisy, Vaquero, Aug. 11 (4116); also Mountain Pine Ridge, Feb. 27, 1931, H. H. Bartlett (11824A). Apparently this is the first record of this rust on *Jacquemontia*. It is a widespread species in the warmer parts of the Americas.

8. Coleosporium paraphysatum Dietel & Holw.—On *Liabum dimidium* Blake, Cohune Ridge, July 10 (3785); also *L. subglandulare* Blake, El Cayo, March–June, 1933, Mercedes Chanek (15A). This rust has had an interesting history. Dietel and Holway (1) described paraphyses for the telia. Magnus (2) has pointed out that these probably were long sterigmata. He, however, described paraphyses for the uredinia. In the study of collections from British Honduras well-developed peridia were found surrounding the uredinia. The spores of collection 3785 also had a much greater range in length than those described for *C. paraphysatum*. Through the kindness of George B. Cummins it has been possible to study all of the collections of this species in the Arthur Herbarium, including the type. This material shows that the uredinia are bordered by peridia. The cells of the peridia

are thin walled, usually long and narrow, especially in the upper portion, and often separate somewhat from each other at the upper margin of the peridium. The urediniospores are very variable in size. In most collections the urediniospores are 14–20 $\times$22–54μ. In collection 3785 from British Honduras they measure 13–24$\times$24–70μ. The species has been collected in Guatemala, Costa Rica, Salvador, and Jalisco, Mexico.

9. Coleosporium Spigeliae Arth.—On *Spigelia* sp., Chalillo Crossing, July 15, 1936 (3851). The markings of the urediniospores of this species are cylindric pegs. This species has been reported from Guatemala and Salvador.

10. Cronartium Quercus (Brondeau) Schroet.—On *Quercus* sp., San Agustin, July 27 (3970, 3971); July 28 (3975); Aug. 12 (4130), Aug. 13 (4136). This is a widespread rust of oaks. In Central America it has been reported from Guatemala. The oak is probably *Quercus oleoides* Cham. & Schecht. The common pine, *Pinus caribaea* Morelet, of the Mountain Pine Ridge is probably the host of the aecial stage.

11. Dasyspora gregaria (Kunze) P. Henn.—On *Xylopia frutescens* Aubl., San Agustin, July 24 (3882); also Maskall, March 31, 1934, Percy H. Gentle (1197A). This is a very curious rust (3). It has been reported from Costa Rica, Panama, and Guatemala, also from South America.

12. Puccinia Arechavaletae Speg.—On *Cardiospermum grandiflorum* Swartz, Cohune Ridge, July 13 (3824); El Cayo, July 21 (3871); also Hector Creek, Sibun River, Dec. 1, 1934, Percy H. Gentle (1414A). Widely distributed in tropical America.

13. Puccinia barbatula Arth. & Johnston.—On *Banisteria laurifolia* L., El Cayo, June 16 (3509). This rust is characterized by large, strongly echinulate urediniospores and hyaline teliospores. It apparently has only been reported from Cuba.

14. **Puccinia belizensis** Mains, sp. nov.—Urediniis amphigenis, cinnamoneis; urediniosporis late obovoideis, 28–34$\times$38–58μ, membranis pallide vel atri-brunneis, 2–3μ crassis, 4–6μ supra, conspicue echinulatis, poris 3–4μ, fere aequatorialibus; teliis

amphigenis, atri-brunneis; teliosporis obovoideis, 20–24×36–48μ, membranis flavo-brunneis, 2–3μ, 3–4μ supra, pedicellis usque 100μ, flavo-brunneis.

Uredinia amphigenous, 0.5–1.0 mm. long, scattered or coalescing in lines, often 3 mm. long on the culms, pulverulent, cinnamon-brown; urediniospores broadly obovoid, 28–34×38–58μ, the wall light or dark brown, 2–3μ, thickened above, 4–6μ, prominently echinulate, the pores 3–4, approximately equatorial. Telia amphigenous, in lines or coalescing on the culms, dark brown; teliospores obovoid, 20–24×36–48μ, the wall yellowish brown, 2–3μ, 3–4μ above, the pedicels up to 100μ yellowish brown.—On *Olyra latifolia* L., Valentin, June 24 (3584); Retiro, June 30 (3700); Valentin, July 3 (3727); Cohune Ridge, July 9 (3772, 3781 type); San Agustin, Aug. 12 (4124).

This species is distinguished from other species on *Olyra* by its large, thick-walled urediniospores. The type, collection 3881, was found closely associated with aecia on *Sebastiania Standleyana* (collection 3780).

15. Puccinia Caleae Arth.—On *Calea* sp., San Agustin, July 25 (3922). The urediniospores of this collection measure 18–25 ×30–40μ and the teliospores, 34–36×46–50μ. The species has been reported from Costa Rica, Guatemala, southwestern Mexico, and northern South America.

16. **Puccinia ciliata** Mains, sp. nov.—Pycniis epiphyllis, globosis, 80–100μ; aeciis amphigenis, aggregatis, sine peridiis; aeciosporis catenulatis, angulare globosis vel ellipsoideis, 16–24 ×20–36μ, membranis hyalinis vel subbrunneis, 1.5–2.0μ, dense et crasse verrucosis; urediniis hypophyllis, sparsis, cinnamoneis, peridiis paraphysibus supra praeditis; paraphysibus cylindriceis, 8–12×40–60μ, introrsum curvatis, membranis hyalinis, inaequalite spissatis; urediniosporis ellipsoideis, 16–20×20–27μ, membranis cinnamoneis, 1.5μ, usque 2.5–3.0μ supra verrucosis; teliis hypophyllis, peridiis paraphysibus supra praeditis; teliosporis obovoideis vel ellipsoideis, 18–26×28–32μ, membranis castaneo-brunneis, 1.5–2.0μ, conoideo-verrucosis, pedicellis brevibus et fragilibus.

Pycnia epiphyllous, globoid, 80–100μ, paraphyses extruding. Aecia amphigenous, grouped, small, 0.2 mm. without peridia; aeciospores catenulate, angularly globoid or ellipsoid, 16–24 $\times$24–36μ, the walls colorless or brownish, 1.5–2.0μ closely and coarsely verrucose. Uredinia hypophyllous, scattered, small, 0.1–0.2 mm. cinnamon-brown, the peridia provided with paraphyses above, the paraphyses cylindric, 8–12$\times$40–60μ, incurved, the walls hyaline, thickened unevenly on the convex side; urediniospores ellipsoid, 16–20$\times$20–27μ, the wall cinnamon-brown, 1.5μ, up to 2.5–3.0μ at the apex, verrucose. Telia hypophyllous, similar to the uredinia; teliospores obovoid or ellipsoid, 18–26$\times$28–38μ, wall chestnut-brown, 1.5–2.0μ, conically verrucose, the pedicels short, fragile.—On *Cordia alliodora* (Ruiz & Pavon) Cham., Macaw Bank, July 22 (3907 type); Cohune Ridge, July 12 (3820).

This species is closely related to *Puccinia Cordiae* (P. Henn.) Arth. Through the kindness of George B. Cummins it has been possible to study material of the latter species from the Arthur Herbarium. This was found to differ somewhat from the descriptions of the species. The spores of the primary sori are catenulate, and the paraphyses of the uredinia usually have thickened walls on the convex side. *Puccinia ciliata* differs from this species in the following; urediniospores 21–24$\times$29–35μ; teliospores 19–26 $\times$34–55μ, with the pedicels swelling at the base.

17. Puccinia Conoclini Seym.—On *Eupatorium* sp., Cohune Ridge, July 11 (3805). This species is widely distributed in Central America and the warmer parts of North and South America.

18. Puccinia crassipes Berk. & Curt.—On *Ipomoea triloba* L., Corozal–Orange Walk Road, Sept. 18, 1933, C. L. Lundell (5002A). This species is widely distributed in the warmer parts of the Americas.

19. Puccinia erratica Jackson & Holw.—On *Vernonia tortuosa* (L.) Blake, Benque Viejo, June 17 (3526); Cohune Ridge, July 9 (3774); San Agustin, Aug. 15 (4137). This is an interesting species. It was originally placed in the genus *Dietelia* and then

transferred to *Endophyllum*. The aecia lack peridia. Uredinia have been described but do not occur in any of the specimens listed here. Collections 3526 and 3774 have pycnia and aecia. Collection 4137 has pycnia, aecia, and telia all apparently arising from the same mycelium. This species has been reported from southern Mexico and Guatemala.

20. Puccinia Gouaniae Holw.—On *Gouania polygama* (Jacq.) Urban, Cohune Ridge, July 9 (3776). This species has been reported from the West Indies, Guatemala, Costa Rica, Panama, and South America.

21. Puccinia Heliotropii Kern & Kellerm.—On *Heliotropium* sp., Duck Run, June 15 (3504). A micropuccinia reported from eastern Guatemala and Venezuela.

22. Puccinia heterospora Berk. & Curt.—On *Abutilon hirtum* (Lam.) Sweet, San Juaquin, Corozal District, Aug. 17, 1933, C. L. Lundell (4966A). This is a widespread rust on the Malvaceae in Tropical America.

23. Puccinia inclita Arth.—On *Ichnanthus tenuis* (Presl.) Hitch. & Chase, San Agustin, July 25 (3916); Aug. 4 (4055); also Mountain Pine Ridge, Feb. 21, 1931, H. H. Bartlett (11625A, 11626A). This species has been previously reported from Puerto Rico and Venezuela.

24. Puccinia Lantanae Farl.—On *Lantana* sp., San Agustin, Aug. 7 (4093); Vaquero, Aug. 11 (4118). This species has been reported from southern Florida, West Indies, southern Mexico, Costa Rica, and South America.

25. Puccinia lateritia Berk. & Curt.—On *Borreria* sp., San Agustin, July 25 (3923); Vaquero, Aug. 11 (4119); on *Crusea calocephala* DC., San Agustin, July 26 (3927); on *Hemididodia* sp., San Agustin, Aug. 12 (4131). This species has been reported on various species of the Rubiaceae in tropical America.

26. Puccinia levis (Sacc. & Bizz.) Magnus.—On *Panicum Sellowii* Nees, San Agustin, July 23 (3878), July 25 (3910); on

Paspalum pilosum Lam., Vaquero, Aug. 10 (4108); also *Paspalum Hartwegianum* Fourn., Tiger Point, Northern River, Nov. 7, 1933, Percy H. Gentle (891A); on *Thrasya campylostachya* (Hack.) Chase. San Agustin, Aug. 2 (4021), Aug. 7 (4089). This is a widespread rust in tropical America.

27. **Puccinia oblata** Mains, sp. nov.—Pycniis epiphyllis, globosis, 100–120μ; aeciis hypophyllis, aggregatis, cylindriceis, albis; aeciosporis globosis vel ellipsoideis, 20–24×26–30μ, membranis hyalinis, 2μ, dense et crasse verrucosis; urediniis hypophyllis, sparsis, cinnamoneis; urediniosporis oblato-globosis, 22–26×16–20μ, membranis cinnamoneis, 1.5μ, echinulatis, poris 2–3, aequatorialibus; teliis hypophyllis, sparsis; teliosporis ellipsoideis, cinnamoneis, 20–26×27–34μ, membranis 1.5μ, 2.5–5μ supra, vel castaneo-brunneis, 23–28×32–40μ, membranis 2–2.5μ, 5–6μ supra, irregulater verruculosis, pedicellis hyalinis, fragilibus.

Pycnia epiphyllous, globoid, 100–120μ, the paraphyses extruding. Aecia hypophyllous, grouped, cylindric, white, the peridial cells 20–26×28–32μ, with the interior walls 6–8μ and the exterior walls 2–3μ; aeciospores globoid or ellipsoid, 20–24×26–30μ, the walls hyaline, 2μ, closely and coarsely verrucose. Uredinia hypophyllis, scattered, small, 0.2 mm.; cinnamon-brown; urediniospores oblate-globoid, 22–26×16–20μ, the walls cinnamon-brown, 1.5μ, echinulate, the pores 2–3μ equatorial. Telia hypophyllous, scattered, small, 0.2 mm.; teliosporis ellipsoid, cinnamon-brown, 20–26×27–34μ, the walls 1.5μ, 2.5–5μ above, or chestnut-brown, 23–28×32–40μ, the walls 2–2.5μ, thickened above, 5–6μ, irregularly verruculose, the pedicels hyaline, fragile. —On *Notoptera scabridula* Blake, Duck Run, El Cayo District, Feb. 17, 1931, H. H. Bartlett (11541A); *Otopappus curviflorus* (R. Br.) Hemsl. Los Amates, Guatemala, Feb. 6, 1905, Chas. C. Deam (89A, type). Both specimens of this rust were obtained from phanerogamic collections.

28. Puccinia obliqua Berk. & Curt.—On *Vincetoxicum* sp., Cohune Ridge, July 11 (3808). A widespread rust of the Asclepiadaceae in Central and the warmer parts of North and South America.

29. Puccinia Palicouriae Mains.—On *Palicourea triphylla* DC. San Agustin, July 23 (3874), July 26 (3942); also Mountain Pine Ridge, May 7, 1931, H. H. Bartlett (13091, type). This species so far is known (3) only from the Mountain Pine Ridge of the El Cayo District.

30. Puccinia paupercula Arth.—On *Pseudelephantopus spicatus* (Juss.) Rohr, Benque Viejo, June 17 (3528); Camp Six, July 19 (3865). A micropuccinia reported from Costa Rica, Guatemala, Panama, and southern Mexico.

31. Puccinia polysora Underw.—On *Tripsacum latifolium* Hitch., San Agustin, July 24 (3898), July 27 (3957). This rust has been reported from the southern United States, West Indies, central Mexico, and Venezuela.

32. Puccinia Sorghi Schw.—On *Zea Mays* L., Vaca-Negroman Road, July 9 (3867). This is the large-spored form previously reported (3) from Uxmal, Yucatán.

33. Puccinia substriata Ellis & Barth.—On *Paspalum* sp., Cohune Ridge, July 11 (3799); Camp Six, July 18 (3863). A common rust in the warmer parts of the Americas.

34. Puccinia tubulosa Arth.—On *Paspalum conjugatum* Bergius, San Agustin, July 29 (4006); Vaquero, Aug. 10 (4110); on *Paspalum plicatulum* Michx., Vaquero, Aug. 10 (4109). This species has been reported from Central America and from the warmer parts of North and South America.

35. Puccinia Urbaniana P. Henn.—On *Cornutia latifolia* (H.B.K.) Moldenke, Maskall, Aug. 29, 1936, Hugh O'Neill (8747A); on *Stachytapheta* sp., Cohune Ridge, July 9 (3779). This species has been reported from southern Florida, West Indies, Costa Rica, Guatemala, and South America.

36. Pucciniosira pallidula (Speg.) Lagerh.—On *Triumfetta* sp., Cohune Ridge, July 11 (3806, 3807); Chalillo Crossing, July 16 (3855); Macaw Bank, July 23 (3909); San Antonio, Aug. 15 (4138). This interesting species has been reported from the West Indies, southern Mexico, Salvador, and South America.

37. Uromyces appendiculatus Fr.—On *Phaseolus gracilis* Poepp., San Agustin, Aug. 7 (4088).

38. Uromyces columbianus Mayor.—On *Melanthera deltoidea* Michx. El Cayo, July 16 (3507). This rust has been reported from the West Indies, Costa Rica, Guatemala, Salvador, and South America.

39. Uromyces costaricensis Syd.—On *Lasiacis* sp., Cohune Ridge, July 10 (3788). This species has been reported from the West Indies, Costa Rica, and South America.

40. Uromyces major Arth.—On *Sporobolus indicus* (L.) R. Br., San Agustin, Aug. 2 (4125). This rust has been reported from the West Indies, southern Texas, Mexico (state), Panama, and northern South America.

41. Uromyces oaxacanus Diet. & Holw.—On *Jatropha tubulosa* Muell. Arg., El Cayo, June 17 (3532). This rust has been reported from Oaxaca, Mexico, and Guatemala.

42. Uromyces proeminens (DC.) Pass.—On *Euphorbia* sp., Duck Run, June 15 (3503). This is a widespread rust of *Euphorbia*.

43. Uromyces sepultus Mains.—On *Setaria tenax* (L. Rich.) Desv., San Agustin, Aug. 2 (4029). This species has been reported from Yucatán, Mexico, and Brazil.

44. Uromyces yurimaguasensis P. Henn.—On *Clitoria guianensis* (Aubl.) Benth., San Agustin, July 24 (3886). This species has been reported from Panama and South America.

45. **Aecidium belizense** Mains, sp. nov.—Pycniis hypophyllis, globosis, 120–140μ; aeciis hypophyllis, aggregatis, cylindriceis; aeciosporis globosis vel late ellipsoideis, 14–19×16–20μ, membranis hyalinis, tenuibus, 0.5–1.0μ, minutissime verruculosis.

Pycnia hypophyllous, globoid, 120–140μ. Aecia hypophyllous, grouped, cylindric, the peridial cells rhomboidal, 15–20×28–35μ, with the outer walls 5–7μ, the inner 3–5μ, coarsely verrucose; aeciospores globoid or broadly ellipsoid, 14–19×16–20μ, the

walls hyaline, thin, 0.5–1.0μ, very finely verruculose.—On *Ipomoea* sp., Macaw Bank, July 22 (3905 type).

There are several species of *Puccinia* on *Ipomoea* for which the primary aecia are unknown. Although some of the aecia of this collection are evidently old other stages are observed indicating that this may be the aecial stage of a heteroecious rust or it may possibly be an *Endophyllum*.

46. **Aecidium collapsum** Mains, sp. nov.—Aeciis sparsis, cylindriceis, cellulis peridii collapsis; aeciosporis ellipsoideis, 20–26×26–35μ, membranis hyalanis vel subbrunneis, 3–4μ dense et crasse tuberatis, sine pycniis.

Pycnia lacking. Aecia scattered, cylindric, the peridial cells collapsed, 26–40×40–60μ in face view, finely verrucose-rugose; aeciospores ellipsoid, 20–26×26–35μ, the walls colorless or brownish, 3–4μ, closely and coarsely tuberculate.—On *Wedelia parviceps* Blake, San Agustin, July 24 (3888 type).

47. Aecidium dalechampiicola P. Henn.—On *Dalechampia Schippii* Standl., Vaquero, Aug. 9 (4100). This species has been reported from Brazil and Venezuela.

48. Aecidium Farameae Arth.—On *Faramea occidentalis* (L.) Rich., Arenal, June 21, 1936, by C. L. Lundell (6178A). This species has been reported from Cuba and the Dominican Republic.

49. **Aecidium Sebastianiae** Mains, sp. nov.—Pycniis hypophyllis, aggregatis, globosis; aeciis hypophyllis, breve cylindriceis, aeciosporis angulare ellipsoideis, 24–34×36–56μ, membranis 1.5–2.0μ, usque 10μ supra, subbrunneis, verrucoso-rugosis.

Pycnia hypophyllous, grouped, globoid. Aecia hypophyllous, short cylindric, the peridial cells 20–30×40–50μ in face view; aeciospores angularly ellipsoid, 24–34×36–56μ, the walls 1.5–2.0μ, up to 10μ above, brownish, verrucose-rugose.—On *Sebastiania Standleyana* Lundell, Valentin, June 24 (3592); Cohune Ridge, July 9 (3780 type); San Agustin, Aug. 4 (4062). Collection 3780 was closely associated with collection 3781 of *Puccinia belizensis* on *Olyra latifolia*.

50. Aecidium Tournefortiae P. Henn.—On *Tournefortia* sp., Benque Viejo, June 17 (3525). This species has been reported from the West Indies, Panama, and South America.

51. **Uredo detecta** Mains, sp. nov.—Urediniis amphigenis, 0.3–0.5 mm., pallide brunneis, pulverulentis; paraphysibus ad marginem, ramosis, imbricatis, fusiformibus 1–2-septatis, 6–8 ×42–60μ, membranis hyalinis vel cinnamoneis, aequabiliter tenuibus, 1.5μ; urediniosporis ellipsoideis vel obovoideis, 12–14×14–20μ, membranis eximie tenuibus 0.5–1μ, hyalinis, minute echinulatis, poris inconspicuis.

Uredinia amphigenous, 0.3–0.5 mm. light brown, pulverulent, the paraphyses marginal, branched, imbricated, fusiform, 1–2-septate, 6–8×42–60μ, the walls hyaline or cinnamon-brown, uniformly thin, 1.5μ; urediniosporis ellipsoid or obovoid, 12–14 ×14–20μ, the walls exceedingly thin 0.5–1.0μ, hyaline, finely echinulate, the pores obscure.—On *Arrabidaea floribunda* (H.B.K.) Loes., Retiro, June 30 (3699 type).

This rust resembles *Cerotelium Holwayi* to some extent. However, the latter has thick-walled paraphyses, and the urediniospores are larger and with the walls thickened. *Uredo Arrabidaeae* has urediniospores 14–20×18–26μ, with the walls thickened at the apices 2–6μ and with 6–8 scattered pores.

52. Uredo Fuirenae P. Henn.—On *Fuirena umbellata* Rottb., Maskall Pine Ridge, Feb. 15, 1934, Percy H. Gentle (1169A). Arthur has placed this questionably in the genus *Puccinia* under the name *Puccinia* (?) *fuirenicola* Arth. Only uredinia are known, and it seems best to treat it as a species of *Uredo*. It has been reported from the West Indies and South America. It is also known from the tropics of the Eastern Hemisphere.

53. Uredo geophilicola P. Henn.—On *Geophila herbacea* (Jacq.) Schum., Valentin, July 5 (3744). This rust develops from a more or less systematic mycelium. It apparently has been reported previously only from Peru.

54. Uredo Guacae Mayor.—On *Epidendrum* sp., San Agustin, Aug. 3 (4043). This species has been reported from the West Indies and Colombia.

55. Uredo rubescens Arth.—On *Dorstenia Contrajerva* L., El Cayo, July 17 (3536); also March 5–13, 1931, H. H. Bartlett (11984A). This species has been reported from the West Indies, Guatemala, Salvador, and South America.

56. **Uredo Trigoniae** Mains, sp. nov.—Pycniis amphigenis, aggregatis, late conoideis, 60–100μ, subcuticularibus; urediniis amphigenis, pulverulentis; urediniosporis late ellipsoideis, 18–26 $\times$26–30μ, membranis subbrunneis vel hyalinis, 1.5μ, conspicue echinulatis, sine pedicellis.

Pycnia amphigenous, grouped, broadly conical, 60–100μ, subcuticular. Uredinia amphigenous, deep seated in the tissue, covered by the overarching epidermis except for an irregular opening, pulverulent; urediniospores broadly ellipsoid, 18–26 $\times$26–30μ, the walls brownish or hyaline, 1.5μ, prominently echinulate with echinulations up to 2.5μ long and somewhat deciduous leaving smooth areas, without pedicels.—On *Trigonia floribunda* Oerst., Retiro, June 30 (3703 type).

57. **Uredo Xyridis** Mains, sp. nov.—Urediniis amphigenis, sparsis, minutis, 0.2 mm.; urediniosporis obovoideis vel ellipsoideis, 14–18$\times$19–24μ, membranis hyalinis, 1μ, dense et minute echinulatis, poris inconspicuis.

Uredinia amphigenous, scattered, small, 0.2 mm., long covered by the overarching epidermis which opens by a small pore or slit; urediniospores obovoid or ellipsoid, 14–18$\times$19–24μ, the wall colorless, 1μ, closely and finely echinulate, the pores inconspicuous.—On *Xyris* sp., Vaquero, Aug. 10 (4106 type). Apparently under the epidermis there is a layer of very thin-walled narrow hyphae which soon collapse.

58. **Uredo Yucatanensis** Mains, sp. nov.—Urediniis amphigenis pulverulentis; paraphysibus cylindriceis vel clavatis, 8–10$\times$30–45μ, membranis tenuibus, 1μ, hyalinis vel subbrunneis; urediniosporis ellipsoideis vel obovoideis, 15–20$\times$19–24μ, membranis hyalinis, 2μ, echinulatis, poris inconspicuis.

Uredinia amphigenous, pulverulent, partly covered by the overarching epidermis; paraphyses marginal, cylindric or clavate, 8–10$\times$30–45μ, the walls thin, 1μ, colorless or brownish; uredinio-

spores ellipsoid or obovoid, 15–20×19–24μ, the walls 2μ, moderately echinulate, the pores inconspicuous.—On *Mimosa albida* Humb. & Bonpl., San Agustin, July 24 (3889 type).

HOST INDEX

Abutilon hirtum
Puccinia heterospora, 22.
Arrabidaea floribunda
Uredo detecta, 51.
Banisteria laurifolia
Puccinia barbatula, 13.
Borreria sp.
Puccinia lateritia, 25.
Calea sp.
Puccinia Caleae, 15.
Cardiospermum grandiflorum
Puccinia Arechavaletae, 12.
Clitoria guianensis
Uromyces yurimaguasensis, 44.
Cordia alliodora
Puccinia ciliata, 16.
Cordia ferruginea
Aveolaria Cordiae, 1.
Cornutia latifolia
Puccinia Urbaniana, 35.
Crusea calocephala
Puccinia lateritia, 25.
Dalechampia Schippii
Aecidium daleschampiicola, 47.
Dorstenia Contrajerva
Uredo rubescens, 55.
Elephantopus mollis
Coleosporium Elephantopodis, 5.
Epidendrum sp.
Uredo Guacae, 54.
Eupatorium Oerstedianum
Coleosporium Eupatorii, 6.
Eupatorium sp.
Cionothrix praelonga, 4.
Puccinia Conoclini, 17.
Euphorbia sp.
Uromyces proeminens, 42.
Faramea occidentalis
Aecidium Farameae, 48.
Fuirena umbellata
Uredo Fuirenae, 52.
Geophila herbacea
Uredo geophilicola, 53.
Gouania polygama
Puccinia Gouaniae, 20.
Heliotropium sp.
Puccinia Heliotropii, 21.
Hemidiodia sp.
Puccinia lateritia, 25.
Ichnanthus tenuis
Puccinia inclita, 23.
Ipomoea triloba
Puccinia crassipes, 18.
Ipomoea sp.
Aecidium belizense, 45.
Coleosporium Ipomoeae, 7.
Jacquemontia azurea
Coleosporium Ipomoeae, 7.
Jatropha tubulosa
Uromyces oaxacanus, 41.
Lantana sp.
Puccinia Lantanae, 24.
Lasiacis sp.
Uromyces coataricensis, 39.
Liabum dimidium
Coleosporium paraphysatum, 8.
Liabum subglandulare
Coleosporium paraphysatum, 8.
Melanthera deltoidea
Uromyces columbianus, 38.
Mimosa albida
Uredo yucatanensis, 58.
Notoptera scabridula
Puccinia oblata, 27.
Olyra latifolia
Puccinia belizensis, 14.
Orthopappus angustifolius
Coleosporium Elephantopodis, 5.
Otopappus curviflorus
Puccinia oblata, 27.

Palicourea triphylla
Puccinia Palicoureae, 29.
Panicum Sellowii
Puccinia levis, 26.
Paspalum conjugatum
Puccinia tubulosa, 34.
Paspalum Hartwegianum
Puccinia levis, 26.
Paspalum pilosum
Puccinia levis, 26.
Paspalum plicatulum
Puccinia tubulosa, 34.
Paspalum sp.
Puccinia substriata, 33.
Phaseolus gracilis
Uromyces appendiculatus, 37.
Pithecolobium Recordii
Chaconia alutacea, 3.
Pseudelephantopus spicatus
Puccinia paupercula, 30.
Pseudelephantopus sp.
Coleosporium Elephantopodis, 5.
Quercus sp.
Cronartium Quercus, 10.
Sebastiania Standleyana
Aecidium Sebastianiae, 49.
Setaria tenax
Uromyces sepultus, 43.
Spigelia sp.
Coleosporium Spigeliae, 9.
Sporobolus indicus
Uromyces major, 40.
Stachytarpheta sp.
Puccinia Urbaniana, 35.
Thrasya campylostachya
Puccinia levis, 26.
Tournefortia sp.
Aecidium Tournefortiae, 50.
Trigonia floribunda
Uredo Trigoniae, 56.
Tripsacum latifolium
Angiopsora pallescens, 2.
Puccinia polysora, 31.
Triumfetta sp.
Pucciniosira pallidula, 36.
Vernonia tortuosa
Puccinia erratica, 19.
Vincetoxicum sp.
Puccinia obliqua, 28.
Wedelia parviceps
Aecidium collapsum, 46.
Xylopia frutescens
Dasyspora gregaria, 11.
Xyris sp.
Uredo Xyridis, 57.
Zea Mays
Puccinia Sorghi, 32.

LITERATURE CITED

1. Holway, E. W. D. 1901. Mexican Fungi. III. Bot. Gaz., 31: 326–38.
2. Magnus, P. 1902. Ueber eine Function der Paraphysen von Uredolagern, nebst einem Beitrage zur Kenntniss der Gattungen Coleosporium. Ber. Deutsche Bot. Gesell., 20: 334–39.
3. Mains, E. B. 1935. Rusts and Smuts from the Yucatán Peninsula. Botany of the Maya Area. Misc. Papers. Carnegie Inst. Wash. Publ., 461: 95–106.
4. ———. 1938. Two Unusual Rusts of Grasses. Mycologia, 30: 42–45.

NOTES ON AGARICS FROM BRITISH HONDURAS

ALEXANDER H. SMITH

THESE notes are based on a collection of agarics from British Honduras which was made by E. B. Mains during the summer of 1936. The collection consists of twenty-seven numbers. Twenty-three species distributed in twelve genera are recognizable. Specific names have been given to only six species, one of which, *Mycena hondurensis*, is described as new. *Mycena tenerrima* (Berk.) Quél is represented by four collections, *Schizophyllum radiatum* (Swartz) Fr. by two, *Mycena hondurensis*, *Marasmius Bertoroi* (Lev.) Murr., *Marasmius polyporoides* Murr., and *Stropharia tenuis* Murr. by one collection each. The genus *Marasmius* is represented by six species, *Mycena* by four and *Clitocybe*, *Amanita*, *Heliomyces*, *Laccaria*, *Lentinus*, *Psathyra*, *Panus*, *Hygrophorus*, *Pleurotus*, and *Tricholoma* by one species each. Because of the present lack of information on the microscopic characters of the species of agarics described from the tropics, it is impossible to determine the identity of many of the collections. The determinations cited above were made as a result of a study of specimens of tropical agarics which are deposited in the Herbarium of the New York Botanical Gardens, New York City. As a part of the study I had occasion to examine much of the material described from tropical North America by Murrill, and it seems pertinent to include in this paper microscopic data on certain species which were first collected in British Honduras. The collections were made by Morton E. Peck, and the species described by W. A. Murrill.

MARASMIUS BERTEROI (Lev.) Murr.—On rotten wood, Valentin, El Cayo District, June 28, 1936 (3660). The specimens of this collection compare very favorably with material under this name at the New York Botanical Gardens. Murrill reported it as occurring throughout most of tropical North America. The pileus is corticated by a compact palisade of clavate-pedicellate cells the apices of which are set with numerous brown-walled pointed

projections. The trama of both gills and pileus becomes reddish in iodine, but the hymenium and spores become pale yellow. The spores are 12–16×2.5–3μ, smooth, obtuse at one end, and taper gradually to a point. Very few were present.

Marasmius polyporoides Murr. (Pl. I, Figs. 5, 6, and 8).—On rotting leaves, Valentin, El Cayo District, June 26, 1936 (3628). The specimens are macroscopically and microscopically identical with the type. The pileus is corticated by a band of clavate contorted cells with coarse pointed projections over their apices. The walls of the projections are pale brown and form a compact brown surface layer which all but obscures the hyaline clavate portion of the cells which bear them. This same type of cell is present along the edges of the gills and reticulations and is occasionally present on the sides as pleurocystidia. No pleurocystidia other than these were seen. The basidia of the type are immature and more or less pointed at the apex, thus somewhat resembling small fusoid ventricose cystidia. In the collection of E. B. Mains the basidia are two- or four-spored. No spores were found in mounts from the type, but in the more mature individuals of collection 3628 they were present. They measure 10–12 ×4–5.5μ. Numerous thick-walled contorted hyphae are present in the pileus and gill trama. When treated with iodine these become dark reddish brown. In KOH they are hyaline or faintly yellowish, but not refractive as in typical lactifers. The hymenium becomes yellow in iodine.

Mycena hondurensis, sp. nov. (Pl. I, Figs. 1 and 2).—Caespitosa; pileus 1–2 cm. latus, convexus demum depressus, glaber, viscidus, sordide brunneo-griseus, striatus; lamellae angustae, adnatae, subdistantes, pallidae; stipes 3–4 cm. longus, 1.5–2.5 mm. crassus, deorsum griseus, sursum pallidus, viscidus; sporae 3.5–4×2.5–3μ, levae; pleurocystidia et cheilocystidia 35–50×8–15μ. Specimen typicum legit E. B. Mains n. 3822, Cohune Ridge, El Cayo, British Honduras, July 12, 1936, in Herb. Univ. of Mich. conservatum.

Pileus 1–2 cm. broad, convex to nearly plane in age, the disk broadly depressed, glabrous, viscid, striate on the margin or

nearly to the disk, pale brownish gray, the margin somewhat paler, margin connivent with the stipe or slightly incurved at first; flesh thin, membranous, pliant, and rather tough; lamellae narrow, bluntly adnate, subdistant to close, pallid grayish brown to whitish, edge not differently colored; stipe 2–4 cm. long, 1.5–2.5 mm. thick, equal or slightly enlarged below, glabrous or the apex faintly powdered, glutinous, tough, hollow, pale brownish gray below, paler above; spores 3.5–4.5×2.5–3μ, smooth, ovoid, bluish gray in iodine; pleurocystidia and cheilocystidia similar, 35–50×8–14μ, fusoid-ventricose with a long contorted pedicel, smooth, hyaline in KOH; pileus trama with a thick layer of gelatinous hyphae over the surface, the hyphae 1.5–2μ in diameter and with numerous clamp connections, the central portion of floccose tissue with cells of the hyphae 8–10μ in diameter, the subhymenium made up of gelatinous narrow hyphae; gill trama with a central strand of floccose tissue flanked on either side by the gelatinous subhymenium; basidia 13–17×5–6μ, four-spored.

Densely cespitose on rotten logs, El Cayo District, British Honduras, E. B. Mains (3822 type) July 12, 1936. This species is close to *Mycena euspeirea* (Berk. & Curt.) Sacc (Pl. I, Figs. 3 and 4). I have examined specimens of the latter at the New York Botanical Gardens which were collected by Earle (No. 419) in Cuba. The points of similarity between the two are as follows: Both have a thick layer of gelatinous hyphae over the pileus and stipe, both are cespitose, have small spores which become bluish gray in iodine, and have similar cystidia. They differ, however, in their gill characters. The gills of *M. euspeirea* are very broad and broadly adnate-decurrent. Those of *M. hondurensis* are narrow, bluntly adnate, and broader in the middle than at the point of attachment. The appearance of the dried specimens is very different. *M. euspeirea* is pallid to whitish, whereas fruit bodies of *M. hondurensis* are dark gray. When revived for sectioning the pilei of *M. euspeirea* are very fragile and gelatinous, the sections readily going to pieces in mounts of KOH. Those of *M. hondurensis*, however, revive well, are rather tenacious, and the sections remain firm in KOH. Cystidia are very abundant in the latter and rare in the former.

STROPHARIA TENUIS Murr.—On a rotten log, Valentin, El Cayo District, British Honduras. June 28, 1936 (3665). The spores of the type measure 6–8.5×4.5–5.5μ, and are dull grayish brown under the microscope. The cheilocystidia measure 25–38×10–18μ, are hyaline and broadly clavate when young. At maturity they are obtusely fusoid-ventricose and smooth. The spores in collection 3665 measure 5.5–6.5×4–4.5μ. The specimens were all young, however, and the presence of abundant immature spores strongly indicates that the discrepancy in size is not taxonomically significant. No pleurocystidia were seen on either the type or on the material gathered by Mains. The pileus trama is covered by a layer of isodiametric enlarged cells with occasional pear-shaped cells scattered through it. The species is thus properly referred to the section Sphintrigerae. The stipes of Mains's specimens have dried darker than those of the type. Apparently this species has been known previously only from the type locality at New Orleans, Louisiana.

HELIOMYCES ANGUSTIFOLIUS Murr. (Pl. I, Figs. 7 and 9).—The pileus trama is homogeneous, compact, and cartilaginous but not gelatinous or even translucent when mounted in KOH. The fruit bodies revive well and are very pliant. Scattered hyphal tips project from the pileus but no well differentiated cells were seen. The gill trama is compact and floccose. Refractive hyphae resembling lactifers are present in both the pileus and gill tramas, and both are yellowish brown in iodine. No cystidia are differentiated. The basidia measure 26–30×5–7μ and taper toward the apex. No individuals with sterigmata were seen. The spores were not abundant and were not seen attached. They measure 6–8 ×3–3.5μ, are smooth, yellowish in iodine, and hyaline in KOH.

HELIOMYCES HONDURENSIS Murr. (Pl. I, Figs. 10 and 11).—The pileus trama is homogeneous and not gelatinous or translucent when mounted in KOH. The gill trama, pileus trama, and hymenium all turn yellowish brown in iodine. No basidia with sterigmata were seen. All of the well-formed cells in the hymenium possessed rather tapering apices, and they thus resembled cystidia somewhat in shape. They were all filled with protoplasm, however, and it is likely that they represent immature basidia. The

cells on the gill edges were the same as those on the sides. Spores were found in the mount on the hymenium but were not attached to sterigmata. They measure 5.5–7×3–3.5μ and are yellowish in iodine.

HELIOMYCES MULTIFOLIUS Murr.—The fruit-bodies revive well. The pileus and gill tramas are homogeneous, rather compact, yellowish in iodine, and fairly translucent in KOH. No differentiated cystidia are present and the basidia are four-spored. The spores measure 5–6×3.5–4μ, are hyaline, smooth, and drop-shaped. In mounts they frequently remain suspended in the fluid and appear globose. When treated with iodine they become yellowish.

HELIOMYCES PECKII Murr. (Pl. I, Figs. 12, 15–17).—The pileus trama is homogeneous and not at all gelatinous in KOH. Numerous fascicles of appressed thick-walled hyphae are present over the surface. They originate from thin-walled cells of the same diameter in the trama-body. Their walls are approximately 2μ thick. The cells measure 6–7μ thick and 50–200μ or more long. Clamp connections are present. The walls of these cells are hyaline in KOH but dark brown in iodine. The trama of the pileus and gills as well as the hymenium is yellowish to brownish in iodine. The spores measure 9–12×5–6μ, are yellowish in iodine and smooth. The basidia measure 26–30×7–9μ, but no good sterigmata were seen. The apices of the mature basidia collapse and do not revive well. Cystidia-like cells are present on the sides and edges of the lamellae but are scarcely differentiated from the basidia. Some were found to measure 35μ long and 10μ wide and to have somewhat tapering apices. These cells were invariably filled with protoplasm, and it is doubtful if they represent true cystidia.

Heliomyces rubritinctus Murr. has exactly the same stature, the same thick-walled hyphae on the pileus, and the same spores as *H. Peckii*. The reactions of all parts to iodine are also the same. On the basis of the dried specimens, *H. rubritinctus* should be placed in synonymy with *H. Peckii*. However, a study of fresh specimens may establish certain color differences which are constant.

HELIOMYCES STRIATUS Murr. (Pl. II, Fig. 1).—The pileus trama is homogeneous and subgelatinous or translucent in KOH. The fruit bodies revive well. The gill trama is also translucent in KOH. Both are compact and yellowish to brownish in iodine. Pleurocystidia and cheilocystidia are not differentiated. The basidia are four-spored. The spores measure 8–10×6–7.5μ, are smooth, yellowish in iodine, and hyaline in KOH. The spores should aid materially in recognizing this species.

HELIOMYCES SUBSPODOIDES Murr. (Pl. I, Figs. 13 and 14).—The trama of the pileus is homogeneous, but a few hyphae 8–10μ in diameter with rounded apices project from the surface. When mounted in KOH both the pileus and gill tramas are somewhat translucent, and when treated with iodine both become pale wax yellow. Pleurocystidia are rare, clavate, 32–40×10–12μ, smooth, and hyaline. The cheilocystidia are more numerous and vary from fusoid-ventricose to clavate. They measure 30–40×8–12μ. The basidia measure 26–36×8–10μ. No sterigmata were seen, and spores were not found.

HELIOMYCES TERRESTRIS Murr. (Pl. II, Figs. 2 and 3).—The fruit bodies are soft and fleshy and not at all typical of the genus. No reliable sections of the pileus trama could be obtained, but it apparently is homogeneous. The trama of both the pileus and the lamellae is floccose and faintly yellowish in iodine. The dried specimens have the stature and appearance of *Heliomyces Peckii* but differ greatly in consistency. The basidia measure 35–40 ×10–16μ and are four-spored. No differentiated cystidia are present on the sides or edges of the gills. The spores are globoid in outline, quadrate-angular, and measure 10–12(14)μ. When mounted in KOH they appear hyaline. In iodine they become yellowish, and oil droplets are abundant. The large basidia and quadrate-angular spores immediately suggest a pink-spored agaric. Spores of various species of *Entoloma* which also have quadrate-angular spores were compared in KOH mounts and were darker with a definitely discernible flesh-colored tint. On the basis of this comparison it does not seem wise to transfer this species from *Heliomyces* until the color of its spore deposit is known.

HELIOMYCES TRANSLUCENS Murr.—This is an exceptionally thin membranous agaric. The dried specimens in the type appear as if made of parchment. The pileus and gill tramas are homogeneous, compact, yellowish in iodine, and not exceptionally translucent when mounted in KOH. The fruit bodies revive well. No cystidia are differentiated and the basidia are four-spored. The spores are 5–6×3μ, cylindric to ellipsoid, yellowish in iodine, and smooth. Many had begun to germinate at the time the specimen was dried.

MARASMIUS HONDURENSIS Murr. (Pl. II, Figs. 4 and 5).—The pileus trama is homogeneous and yellowish in iodine. A few undifferentiated hyphal cells were found which projected, and very likely caused the "hispid" character mentioned in Murrill's description. The gill trama is compact, yellowish in iodine, and floccose. The basidia are four-spored. Scattered fusoid-ventricose pleurocystidia were found which measured 18–22×7–10μ and were practically imbedded in the hymenium. The spores measure 6–8×3.5–4μ and are smooth and yellowish in iodine. Not many were found, and the indications are that those measured were immature.

MARASMIUS PECKII Murr.—The pileus is corticated by clavate cells with the apices covered by coarse brown-walled echinulations. Both the pileus and gill trama become yellowish brown in iodine. Pleurocystidia are not differentiated. The cheilocystidia are rare to abundant, and clavate with coarsely echinulate apices. In general they resemble the cells covering the surface of the pileus. The basidia measure 14–18×6–8μ, but sterigmata were not seen. Spores were rare and were not seen attached. Those found measured 5–6×4–5μ, were broadly ovoid to subglobose, and yellowish in iodine.

MARASMIUS SUBTENERRIMUS Murr. (Pl. II, Figs. 9, 10, 12, and 13).—The pileus trama is corticated by a band of hyaline clavate cells 10–12×6–8μ, which have thin finger-like projections scattered over their apices. The projections have hyaline walls, and in this respect differ from the usual brown-walled type. The trama of both the pileus and gills is yellowish brown in iodine. The cheilo-

cystidia are fusoid-ventricose, 25–34×8–10μ, and smooth. Pleurocystidia are similar but very rare. The basidia measure 16–18 ×7–9μ. Sterigmata were not seen. The spores measure 5–6×3–3.5μ and are hyaline in KOH and yellowish in iodine. When mounted in the medium containing iodine and viewed with an oil immersion lens they appear very finely echinulate. As observed in KOH under lower magnifications they appeared smooth. These spores were not seen attached to sterigmata, but the manner in which they were distributed over the hymenium indicates that they belong to the species.

PLUTEUS SPINULOSUS Murr. (Pl. II, Figs. 6–8, and 11).—The pleurocystidia and cheilocystidia are similar and very abundant. Those on or near the edge measure 50–60×9–14μ. Those farther back are 65–90×10–20μ. Their apices are sharply acuminate and bear scattered pointed projections over the tapered portion. Refractive hyphae resembling lactifers are present in the trama of the gills and pileus. A thin pellicle is present over the cap. The basidia are four-spored, and the spores measure 6–8×6–7.5μ. In KOH mounts the latter appear pale flesh color.

PLATE I

FIG. 1. Three pleurocystidia of *Mycena hondurensis*. ×750.
FIG. 2. Six spores of *Mycena hondurensis*. ×1650.
FIG. 3. Two pleurocystidia of *Mycena euspeirea*. ×750.
FIG. 4. Five spores of *Mycena euspeirea*. ×1650.
FIG. 5. Three spores of *Marasmius polyporoides*. ×1650.
FIGS. 6 and 8. Thick-walled hyphae found in the trama of the pileus and gills of *Marasmius polyporoides*. ×750.
FIG. 7. A refractive hypha from the gill trama of *Heliomyces angustifolius*. ×750.
FIG. 9. Five spores of *Heliomyces angustifolius*. ×1650.
FIG. 10. Two basidia (?) of *Heliomyces Peckii*. ×1650.
FIG. 11. Five spores of *Heliomyces hondurensis*. ×1650.
FIG. 12. Two basidia (?) of *Heliomyces Peckii*. ×1650.
FIG. 13. Three basidia and one pleurocystidium of *Heliomyces subspodoides*. ×750.
FIG. 14. Two cheilocystidia of *Heliomyces subspodoides*. ×750.
FIG. 15. Three spores of *Heliomyces Peckii*. ×1650.
FIG. 16. Two hyphae from the pileus surface of *Heliomyces Peckii*. ×250.
FIG. 17. Two cheilocystidia of *Heliomyces Peckii*. ×1650.

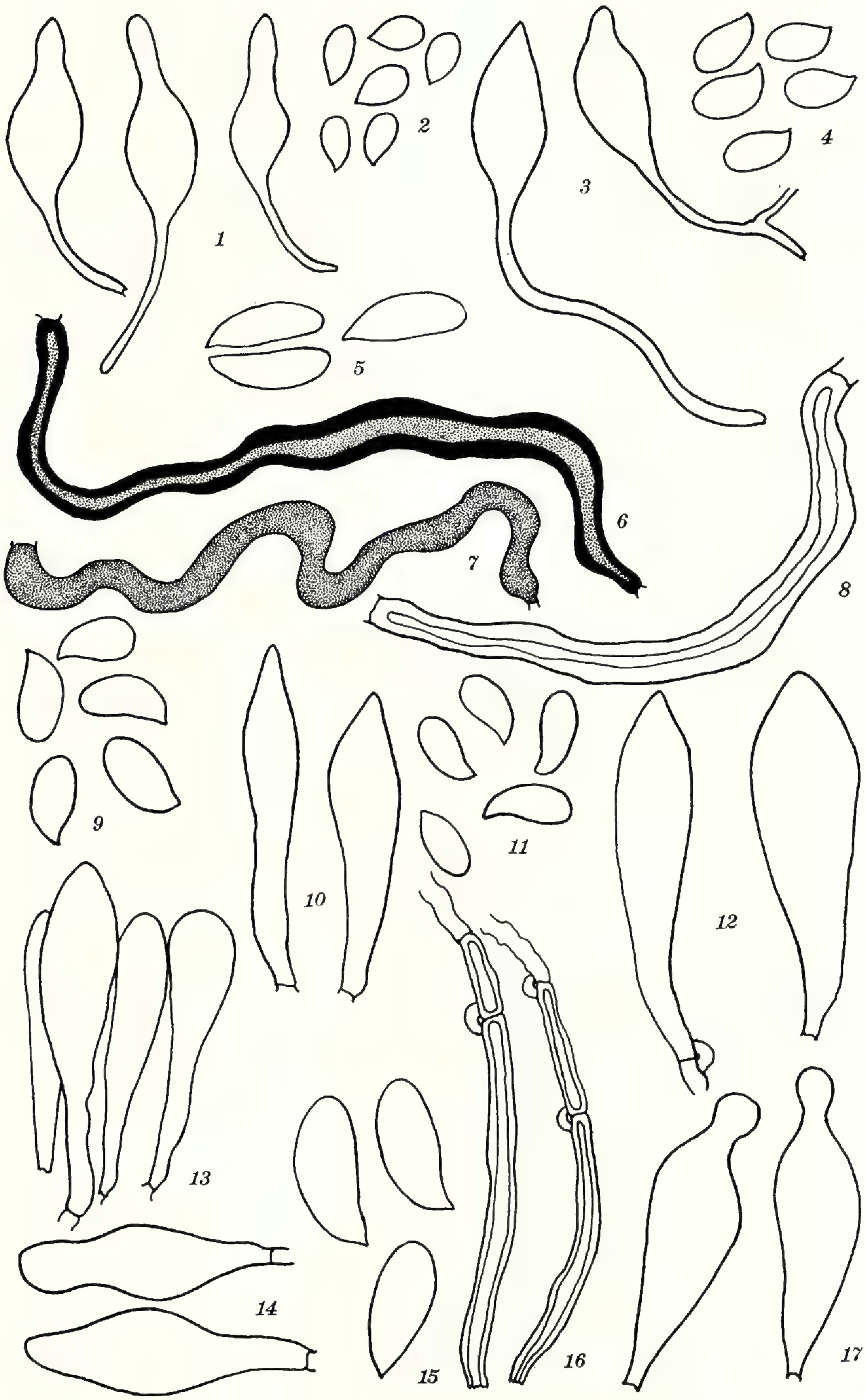
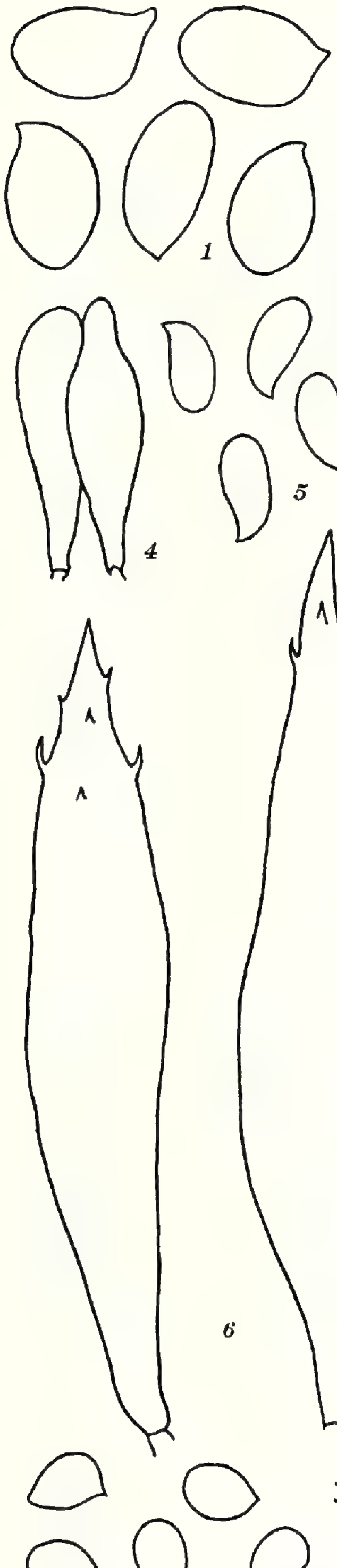
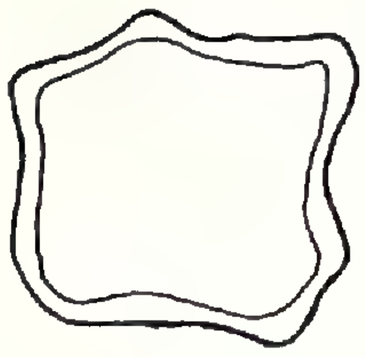
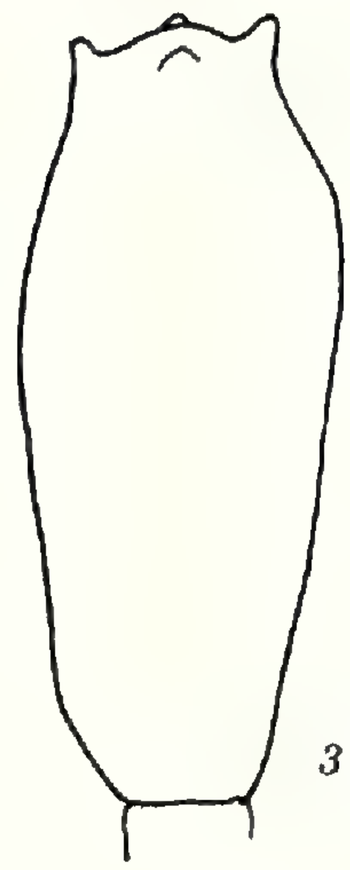

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

PLATE II

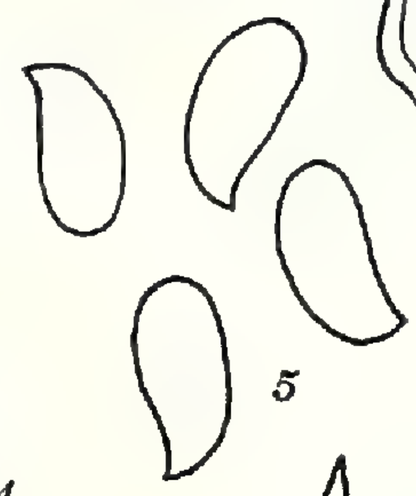
FIG. 1. Five spores of *Heliomyces striatus*. ×1650.
FIG. 2. Four spores of *Heliomyces terrestris*. ×1650.
FIG. 3. A basidium of *Heliomyces terrestris*. ×1650.
FIG. 4. A basidium and cheilocystidium of *Marasmius hondurensis*. ×750.
FIG. 5. Four spores of *Marasmius hondurensis*. ×1650.
FIG. 6. Two large pleurocystidia of *Pluteus spinulosus*. ×750.
FIG. 7. Two cheilocystidia of *Pluteus spinulosus*. ×750.
FIG. 8. Five spores of *Pluteus spinulosus*. ×1650.
FIG. 9. A pleurocystidium of *Marasmius subtenerrimus*. ×750.
FIG. 10. Immature basidia of *Marasmius subtenerrimus*. ×750.
FIG. 11. Two refractive hyphae of *Pluteus spinulosus*. ×750.
FIG. 12. Five spores of *Marasmius subtenerrimus*. ×1650.
FIG. 13. Two cheilocystidia of *Marasmius subtenerrimus*. ×750.


1

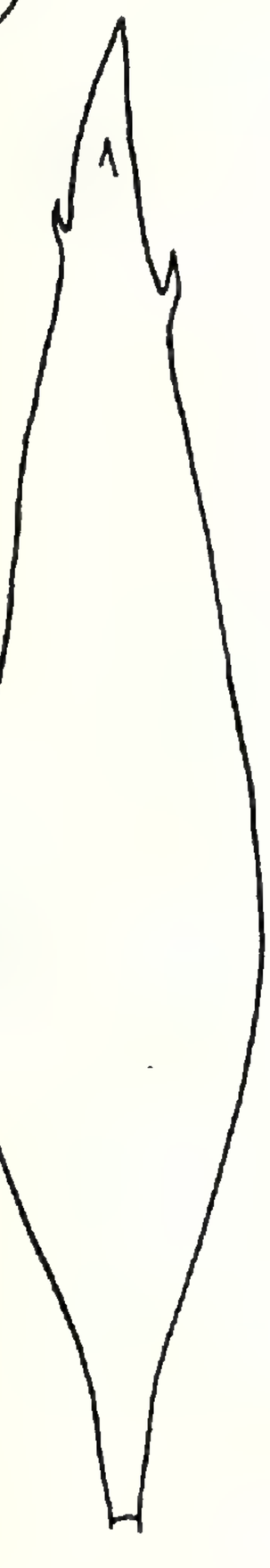

2

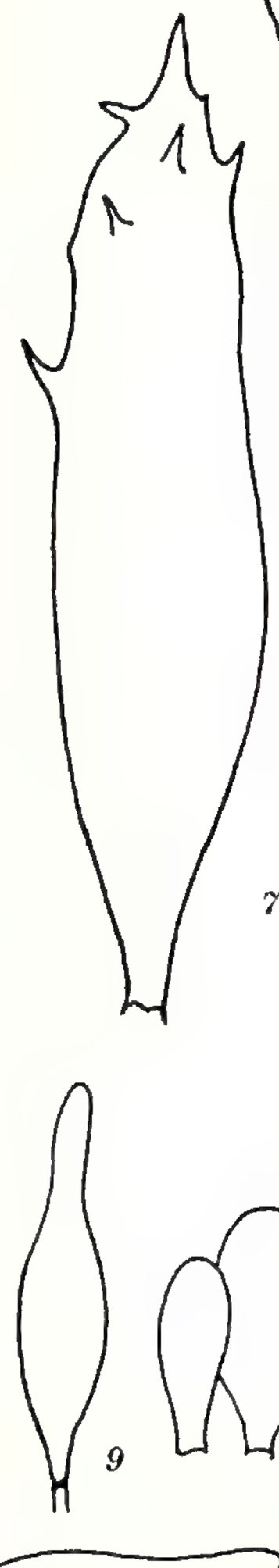

3

4

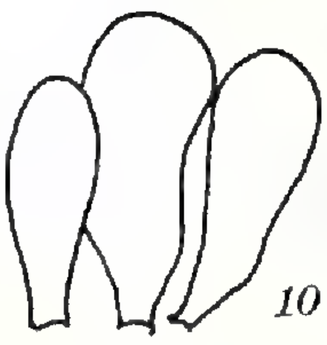

5

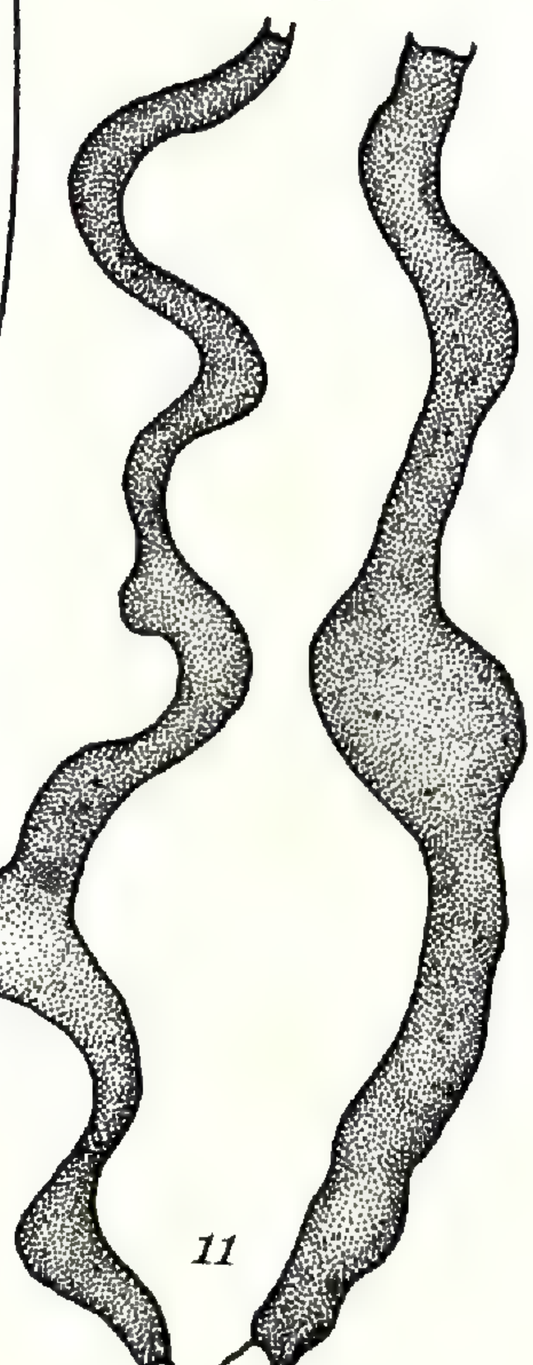
6

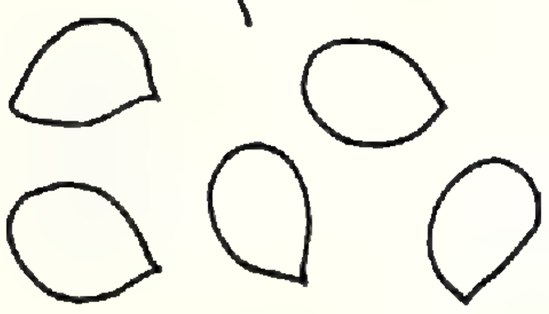

7

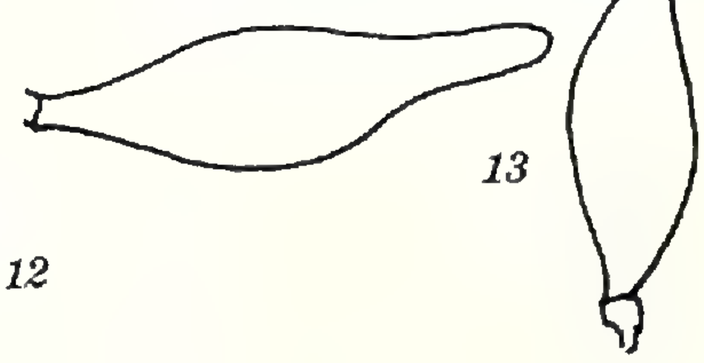

8

9


10


11


12


13

CONTRIBUTIONS FROM THE UNIVERSITY
OF MICHIGAN HERBARIUM

No. 1. Rusts from British Honduras, by Edwin B. Mains.

Notes on Agarics from British Honduras, by Alexander H. Smith. 28 pp., 2 pls. Price, $.25.